

WHAT IS CLAIMED IS:

1. A semiconductor laser device comprising:

a semiconductor laser chip having an active layer and an allover electrode, the allover electrode forming a lower face of the semiconductor laser chip;

a Si thin film formed on a light emitting end surface of the semiconductor laser chip;

a protective film having a specified reflectance and formed on the Si thin film, wherein

10 the Si thin film is comprised of an upper Si thin film formed on an upper portion of the light emitting end surface and a lower Si thin film formed on a lower portion of the light emitting end surface,

15 the upper Si thin film covers an end of the active layer and the lower Si thin film covers an end of the allover electrode, and

the lower Si thin film is smaller in thickness than the upper Si thin film.

2. The semiconductor laser device as defined in
20 Claim 1, wherein

the lower Si thin film is 10 Å or less in thickness.

3. The semiconductor laser device as defined in
Claim 1, wherein

25 the Si thin film is formed only by the upper Si

thin film, and

the protective film is formed in an interception area of the lower Si thin film on the lower portion of the light emitting end surface.

5 4. The semiconductor laser device as defined in Claim 3, wherein

the interception area is connected to the lower face of the semiconductor laser chip.

5. The semiconductor laser device as defined in
10 Claim 1, wherein

the allover electrode is made of gold.

6. A manufacturing method of a semiconductor laser device including:

15 a semiconductor laser chip having an active layer and an allover electrode, the allover electrode forming a lower face of the semiconductor laser chip;

a Si thin film formed on a light emitting end surface of the semiconductor laser chip;

20 a protective film having a specified reflectance and formed on the Si thin film, wherein

the Si thin film is comprised of an upper Si thin film formed on an upper portion of the light emitting end surface and a lower Si thin film formed on a lower portion of the light emitting end surface,

25 the upper Si thin film covers an end of the

active layer and the lower Si thin film covers an end of the allover electrode,

the lower Si thin film is smaller in thickness than the upper Si thin film,

5 the manufacturing method of the semiconductor laser device comprising the step of

shielding the lower portion of the light emitting end surface by using a shielding member when the Si thin film is formed.

10 7. A laser bar locking apparatus for locking a laser bar, the laser bar having an active layer of laser chips and an allover electrode forming a lower face of the laser chips, the laser bar locking apparatus comprising:

a flat portion for mounting the laser bar thereon
15 by contacting the allover electrode with the flat portion;
and

20 a shielding portion provided on a side of the flat portion in such a manner that the shielding portion is located lower than a position of the active layer so as to shield a lower portion of a light emitting end surface of the laser chips in the laser bar.

8. The laser bar locking apparatus as defined in
Claim 7, wherein

25 the flat portion is provided with a vacuum suction hole for locking the laser bar by sucking air in

the vacuum suction hole.

9. The laser bar locking apparatus as defined in
Claim 7, wherein

5 a width of the flat portion is a length obtained
by adding approximately 50 μm to 80 μm to a length of a
resonator of the laser chip.